REMARKS/ARGUMENTS

Claims 2-4, 6-10, 12-14 and 16-27 remain in the present application, of which claims 2, 6, 12, 16 and 26 are independent. Claims 2, 6, 12, 16, 23 and 26 have been amended herein. A new claim 27 has been added. Applicants respectfully request reconsideration and allowance of claims 2-4, 6-10, 12-14 and 16-26. Applicants further respectfully request that the newly added claim 27 be considered on the merits and allowed.

Applicants appreciate the time and courtesy extended to applicants' attorney (Jun-Young E. Jeon, Reg. No. 43,693) during the telephone interview of October 28, 2003, in which claims 2, 12 and 16 were discussed. During the interview, applicants' attorney agreed to submit an amendment to the claims, pending approval of such amendment by applicants.

After the Examiner had a chance to review the present response, applicants would like to schedule another telephone interview to discuss the response in order to expedite the prosecution of this case. Applicants' attorney will call the Examiner in about two weeks to schedule such telephone interview.

Claims 2-4, 6-10, 12-14, 16-21 and 23-25 have been rejected under 35 U.S.C. § 103(a) as allegedly being obvious over U.S. Patent No. 5,308,917 ("Kitamura et al."). Further, claims 22 and 26 have been rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Kitamura et al. in view of U.S. Patent No. 6,075,196 ("Fujiwara et al.").

Regarding claims 2, 6, 12 and 16, the Office Action states that "Kitamura teaches generation of touch curves with respect

to various degrees of the strength of depressions. Furthermore, Kitamura teaches an interpolator (30) which interpolates the input touch data and form a response curve representing touch-tone level character," and cites Col. 3, Lines 1-12, Col. 5, Lines 51-56 and FIGs. 2, 8-10.

The Examiner agrees that Kitamura et al. does not specifically teach "a correction coefficient generator which generates a correction coefficient composed of a ratio of one of said velocity values corresponding to one of said touch data generated by said keyboard device under said predetermined operation mode to a maximum value of said velocity values." However, the Examiner contends, "it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize Kitamura's velocity, VELO and maximum velocity, Vmax for the purpose of touch curve data generation. One would have been motivated in view of Kitamura that simply dividing the velocity, VELO by the maximum velocity, Vmax is mathematically and functionally equivalent to the desired correction coefficient."

Applicants submit that the Examiner's contentions are wrong for at least the following reasons:

First, as stated above, Kitamura et al. teaches the generation of a touch curve through interpolating various touch data values from various degrees of the strength of depressions to create a touch curve. By way of contrast, the recited "touch curve generator" in applicants' claim 2, is stated in that claim "to shift the touch curve, thereby generating the new touch curve." Applicants do not see how the generation of a

correction coefficient to correct an existing touch curve would have been obvious from the teachings of Kitamura et al., which teaches an interpolation technique that creates a touch curve.

Second, in the touch control apparatus according to an exemplary embodiment of the present invention, "only one hit with a force, which the user considers as the maximum keying power, enables the velocity value forming the touch curve to be increased in accordance with the keying power of the user. Thus, a large sound volume can be produced with a weak keying power. In this way, the user can adjust the electronic instrument so as to obtain a desirable touch response by using an easy operation in a short time." (page 26, lines 17-26 of the specification).

Such capability to correct the touch curve using only one hit with a force is made possible through use of a novel and unobvious generation of a correction coefficient and its multiplication to the existing correction curve.

Kitamura et al. also teaches to make a touch curve from "depression pressure (touch) values p in units of strengths in association with at least three setting points, i.e., low-touch (piano), middle-touch (mezzo forte), and high-touch (forte) setting points" Col. 2, lines 53-57). Moreover, "when the depression pressure is detected, the keyboard is depressed a plurality of number of times . . . the player performs keyboard operations for touch detection while recognizing the tone level corresponding to the touch strength according to his or her feeling." (Col. 2, lines 57-66). Hence, Kitamura et al., in addition to requiring the player to hit the key a number of

times (also, see FIGs. 5-7), also appears to assume that the players are able to recognize the differences between *piano*, *mezzo forte* and *forte* in their keystrokes, which certainly would be very difficult for beginners.

These precisely are some of the problems in the prior art that are addressed by one exemplary embodiment of the present invention. For example, it is difficult for beginners to know what degree of keying power leads to the weak hitting, the middle hitting or the strong hitting. Thus, it is difficult to create the desirable touch curve. By way of contrast, the recited "touch curve generator" in applicants' claims 2, is stated in that claim to "shift the touch curve, thereby generating the new touch curve" Thus, in an exemplary embodiment of the present invention, the player is allowed to change the touch curve simply by hitting the key once using a maximum strength stroke, which virtually anyone should be able to do.

In reference to claim 26, the Office Action states that "the single hit performance technique as represented in Fig. 5 [of Fujiwara et al.] is equivalent to the desired 'single keying power'." However, Fujiwara teaches performing multiple single hits with multiple different string-striking velocities (and therefore multiple different keying powers), and not as recited in claim 26, "a correction curve memory which stores a correction curve . . . wherein the correction curve is generated through pushing at least one of a plurality of keys using a single keying power; and a corrector which corrects a plurality of the correction values . . . based on said touch data

generated by said keyboard device to shift the correction curve, thereby generating a new correction curve."

Third, Kitamura et al. teaches an interpolation technique to generate a touch curve in which "multiple coefficients" are used, i.e., one for each of VELO L, VELO M, VELO H and V MAX (e.g., see FIGs. 8-11 and Col. 5, and formulas (1) to (4) on Col. 4 and Col. 5). Such use of "multiple coefficients" teaches away from "a touch curve generator which multiplies a plurality of said velocity values by said correction coefficient to shift the touch curve, thereby generating the new touch curve."

Fourth, applicants have added claim 27, which depends from claim 2. Claim 27 recites "wherein the correction coefficient generator generates another correction coefficient composed of a ratio of one of said velocity values corresponding to one of other touch data to the maximum value of said velocity values, and the touch curve generator multiplies the plurality of said velocity values by said another correction coefficient to shift the touch curve, thereby generating another new touch curve." Clearly, this structure in combination with that of claim 2 is not taught by Kitamura et al. or any other reference of record. Applicants do not see in any of the sections of Kitamura et al. cited in the Office Action any teaching or suggestion of a touch curve generator which multiplies a plurality of velocity values by another correction coefficient to shift the same touch curve, thereby generating another new touch curve, which may be different from the new touch curve of claim 2. Therefore, claim 27 should be allowed, and allowance is requested.

Claim 2 is not anticipated nor is it obvious over the cited art for the reasons described above.

Claims 3, 4, 21-25 and 27 each depend, directly or indirectly, from claim 2, and incorporate all the terms and limitations of claim 2 in addition to other limitations, which together further patentably distinguish them over the cited references. Therefore, the rejection of claims 3, 4 and 21-25 should be withdrawn and they should be allowed.

Claim 12 recites, in a relevant portion, "correcting velocity values of said touch curve based on said generated touch data to generate a new touch curve; and switching an operation mode to a predetermined operation mode, wherein said correcting velocity values comprises, generating a correction coefficient composed of a ratio of one of said velocity values corresponding to one of said touch data generated in said touch curve generating step under said predetermined operation mode to a maximum value of said velocity values, and multiplying a plurality of said velocity values by said correction coefficient to shift the touch curve, thereby generating the new touch curve." Kitamura et al. does not teach or suggest such touch curve shift to generate a new touch curve. Therefore, applicants request that the rejection of claim 12 be withdrawn and that it be allowed.

Claims 13 and 14 depend, directly or indirectly, from claim 12, and incorporate all the terms and limitations of claim 12 in addition to other limitations, which together further patentably distinguish them over the cited references. Therefore,

applicants request that the rejection of claims 13 and 14 be withdrawn and that they be allowed.

Regarding claims 6 and 16, the Office Action states that "Kitamura teaches a curve memory for storing conversion curve data defined by polygon line, and an interpolation means which takes into account average value data, a predetermined tone level and certain calculation the result of which is calculated correspondence as the conversion data in the curve memory. It would have been obvious that the interpolation means equivalently provides the desired scenario of correction value becoming the predetermined value," and cites Col. 1, Lines 52-55, 65-68 and Col. 2, Lines 1-5.

Claim 6 recites, in a relevant portion, "[a] touch control apparatus comprising . . . a correction curve memory which stores a correction curve indicative of correction values to correct a keyboard curve indicative of a correspondence relation of velocity and touch data, said correction values corresponding to said touch data generated by said keyboard device; a corrector which corrects a plurality of the correction values stored in said correction curve memory based on said touch data generated by said keyboard device to shift the correction curve, thereby generating a new correction curve; and a mode switch which switches an operation mode of said touch control apparatus to a predetermined operation mode, wherein said corrector, when a correction value corresponding to said touch data generated by said keyboard device under said predetermined operation mode is different from a predetermined standard value, corrects said correction curve stored in said correction curve memory such

that said correction value becomes the predetermined standard value."

Applicants do not see in Kitamura et al. any teaching or suggestion of a correction curve memory which stores "a correction curve indicative of correction values to correct a keyboard curve indicative of a correspondence relation of velocity and touch data, said correction values corresponding to said touch data generated by said keyboard device" as recited in claim 6.

Further, applicants do not agree that the interpolation means equivalently provides the desired scenario of correction value becoming the predetermined value. For example, as Kitamura el al. teaches creating a touch curve through interpolation, applicants do not see how this teaches or suggests "when a correction value corresponding to said touch data . . . is different from a predetermined standard value, corrects said correction curve . . . such that said correction value becomes the predetermined standard value." Since Kitamura et al. does not teach or suggest such touch control apparatus, applicants request that the rejection of claim 6 be withdrawn and that it be allowed.

Since claims 7-10 depend, directly or indirectly, from allowable claim 6, they incorporate all the terms and limitations of claim 6 in addition to other limitations, which together further patentably distinguish them over the cited references. Therefore, applicants request that the rejection of claims 7-10 be withdrawn and that they be allowed.

Claim 16 recites, in a relevant portion, "storing a correction curve indicative of correction values to correct a keyboard curve indicative of a correspondence relation of velocity and touch data . . . correcting a plurality of said stored correction values based on said generated touch data to shift the correction curve, thereby generating a new correction curve; and switching an operation mode to a predetermined operation mode, wherein . . . when a correction value corresponding to said touch data generated under said predetermined operation mode is different from a predetermined standard value, corrects said stored correction curve such that said correction value becomes the predetermined standard value." Since Kitamura et al. does not teach or suggest such touch control method, applicants request that the rejection of claim 16 be withdrawn and that it be allowed.

Since claims 17-20 depend, directly or indirectly, from claim 16, they incorporate all the terms and limitations of claim 16 in addition to other limitations, which together further patentably distinguish them over the cited references. Therefore, applicants request that the rejection of claims 17-20 be withdrawn and that they be allowed.

Regarding claim 26, the Office Action states that "Fujiwara on the other hand teaches a relationship between a key velocity and a string-striking velocity such that white points represents results of relationship between the key velocity and the string-striking velocity with respect to a single-hit performance technique," and cites FIG. 5 and Col. 9, Lines 35-42. The Office Action also states that "the single hit performance

technique as represented in Fig. 5 [of Fujiwara et al.] is equivalent to the desired 'single keying power'." Applicants do not agree.

Claim 26 recites, in a relevant portion, "a correction curve memory which stores a correction curve indicative of correction values to correct a keyboard curve indicative of a correspondence relation of velocity and touch data, said correction values corresponding to said touch data generated by said keyboard device, wherein the correction curve is generated through pushing at least one of the plurality of keys using a single keying power."

By way of contrast, FIG. 5 of Fujiwara illustrates a number of white circles, each representing a "single-hit performance." The string-striking velocity of these single-hit performances vary from about 100 mm/sec to about 750 mm/sec. Fujiwara et al. teaches performing multiple single hits with multiple different string-striking velocities (and therefore multiple different keying powers). Neither Kitamura et al. nor Fujiwara et al. teaches or suggests the touch control apparatus of claim 26. Therefore the rejection based thereon should be withdrawn and claim 26 should be allowed.

In view of the foregoing amendments and remarks, applicants respectfully request allowance of claims 2-4, 6-10, 12-14 and 16-27 and an early issuance of a patent. If there are any remaining issues that can be addressed over the telephone, the Examiner is invited to call applicants' attorney at the number listed below.

Respectfully submitted,
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